

Application No.: 09/707,269

Case No.: 53415US038

1-15. (canceled)

16. (currently amended) A working liquid useful in modifying a surface of a wafer suited for fabrication of a semiconductor device, the liquid being an aqueous solution of initial components substantially free of loose abrasive particles, the components comprising:

- a. an oxidizing agent;
- b. a complexing agent;
- c. a passivating agent comprising a material selected from the group consisting of benzotriazole, azole derivatives of benzotriazole, and tolytriazole; and
- d. a buffer comprising a polyprotic protolyte having at least one pK_a greater than 7.

17. (canceled)

18. (canceled)

19. (previously presented) The working liquid of claim 16 wherein the buffer comprises a material selected from the group consisting of systems of fully or partially neutralized polyprotic acids, phosphoric acid-ammonium phosphate systems, polyphosphoric acid-ammonium polyphosphate systems, boric acid-ammonium tetraborate systems, boric acid-ammonium pentaborate systems, ion buffer systems of aspartic acid, ion buffer systems of glutamic acid, ion buffer systems of histidine, ion buffer systems of lysine, ion buffer systems of arginine, ion buffer systems of ornithine, ion buffer systems of cysteine, ion buffer systems of tyrosine, ion buffer systems of carnosine and combinations thereof.

20. (previously presented) The working liquid of claim 16 wherein the complexing agent is a multidentate complexing agent.

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21. (previously presented) The working liquid of claim 16 wherein the oxidizing agent comprises a material selected from the group consisting of hydrogen peroxide, nitric acid, sulfuric acid, chromic-sulfuric acids, coordination compounds, halogen oxo acids, salts of halogen oxo acids, ammonium persulfates, sodium persulfates, potassium persulfates and combinations thereof.

22. (previously presented) The working liquid of claim 21 wherein the coordination compound comprises a material selected from the group consisting of potassium ferricyanide, ferricyanide, ferric nitrate, ferric chloride, ammonium ferric ethylenediaminetetraacetic acid, ammonium ferric citrate, ferric citrate, ammonium ferric oxalate, cupric citrate, cupric oxalate, cupric gluconate, cupric glycinate, cupric tartrate, cupric chloride, vanadium coordination compounds, chromium coordination compounds, manganese coordination compounds, cobalt coordination compounds, molybdenum coordination compounds, tungsten coordination compounds and combinations thereof.

23. (previously presented) The working liquid of claim 21 wherein the halogen oxo acid comprises a material selected from a group consisting of chloric acid, chlorous acid, hypochlorous acid, bromic acid, perbromic acid, iodic acid, periodic acid, orthoperiodic acid and combinations thereof.

24. (previously presented) The working liquid of claim 21 wherein the salt of halogen oxo acids comprises a material selected from a group consisting of sodium chlorate, sodium chlorite, sodium hypochlorite, sodium bromite, sodium bromate, sodium perbromate, sodium iodates, sodium periodates, sodium orthoperiodates and combinations thereof.

25. (previously presented) The working liquid of claim 16 wherein the complexing agent comprises a material selected from the group consisting of carboxylic acid, ammonia, amines, halides, pseudohalides, carboxylates, thiolates, and combinations thereof.

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26. (previously presented) The working liquid of claim 20, wherein the multidentate complexing agent comprises a material selected from the group consisting of polyphosphates, 1,3-diketones, aminoalcohols, aromatic heterocyclic bases, phenols, aminophenols, oximes, Schiff bases, sulfur compounds, multidentate amines, ethylenediamine, diethylene-triamine, triethylenetetramine, multidentate carboxylic acid, citric acid, tartaric acid, oxalic acid, gluconic acid, nitriloacetic acid, amino acids, glycine, common analytical chelating agents, ethylenediaminetetraacetic acid, and combinations thereof.

27. (canceled)

28. (canceled)

29. (previously presented) The working liquid of claim 16 wherein the working liquid comprises less than 0.1% by weight of loose abrasive particles.

30. (previously presented) The working liquid of claim 16 wherein the working liquid comprises 0% by weight of loose abrasive particles.

31. (previously presented) The working liquid of claim 16 further comprising an additive selected from the group consisting of surfactants, wetting agents, reducing agents, rust inhibitors, lubricants, soaps, and combinations thereof.

32. (previously presented) The working liquid of claim 16 wherein the oxidizing agent is concentrated in aqueous solution from about .01 % by weight to about 50% by weight.

33. (previously presented) The working liquid of claim 32 wherein the oxidizing agent is concentrated in aqueous solution from about .02 % by weight to about 40% by weight.

34. (previously presented) The working liquid of claim 16 wherein the complexing agent is concentrated in aqueous solution from about .01 % by weight to about 50% by weight.

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35. (previously presented) The working liquid of claim 34 wherein the complexing agent is concentrated in aqueous solution from about .02 % by weight to about 40% by weight.

36. (currently amended) A working liquid useful in modifying a surface of a wafer suited for fabrication of a semiconductor device, the liquid being an aqueous solution of initial components substantially free of loose abrasive particles, the components comprising:

- a. an oxidizing agent;
- b. a complexing agent;
- c. a passivating agent comprising a material selected from the group consisting of benzotriazole,azole derivatives of benzotriazole, and tolytriazole; and
- d. a buffer comprising a polyprotic protolyte having at least one pK_a greater than 7,

wherein the oxidizing agent comprises a material selected from the group consisting of nitric acid, sulfuric acid, chromic-sulfuric acids, coordination compounds, halogen oxo acids, salts of halogen oxo acids, ammonium persulfates, sodium persulfates, potassium persulfates and combinations thereof.

37. (previously presented) The working liquid of claim 36 wherein the complexing agent comprises a material selected from the group consisting of carboxylic acid, ammonia, amines, halides, pseudohalides, carboxylates, thiolates, multidentate complexing agents, and combinations thereof.

38. (previously presented) The working liquid of claim 37, wherein the multidentate complexing agent comprises a material selected from the group consisting of polyphosphates, 1,3-diketones, aminoalcohols, aromatic heterocyclic bases, phenols, aminophenols, oximes, Schiff bases, sulfur compounds, multidentate amines, ethylenediamine, diethylene-triamine, triethylenetetramine, multidentate carboxylic acid, citric acid, tartaric acid, oxalic acid, gluconic acid, nitriloacetic acid, amino acids, glycine, common analytical chelating agents, ethylenediaminetetraacetic acid, and combinations thereof.

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39. (canceled)

40. (canceled)

41. (currently amended) A working liquid useful in modifying a surface of a wafer suited for fabrication of a semiconductor device, the liquid being an aqueous solution of initial components substantially free of loose abrasive particles, the components comprising:

- a. an oxidizing agent;
- b. a complexing agent;
- c. a passivating agent comprising a material selected from the group consisting of benzotriazole,azole derivatives of benzotriazole, and tolytriazole; and
- d. a buffer comprising a polyprotic protolyte having at least one pK_a greater than 7,

wherein the passivating agent comprises a material selected form the group consisting of tolytriazole, cuprous oxide, phosphates, alkene oxide condensation products of fatty acid polyamides, 4-alkylpyrocatechols, amine borates, β -(o-carboxybenzylthio) propionitrile, chromate ion, cobalt lineolate, dicyclohexylammonium nitrite, egg albumin, formaldehyde, 2-guanidinobenzimidazole, hexamethylenecamine nitrobenzoates, hydrazine, mercaptobenzothiazole, naphthenic acids, organosilicon compounds, propargyl alcohol, sodium adipate, sodium arsenite, sodium benzoate, sodium nitrite, sodium oleate, sodium sulfite, high molecular weight sulfur compounds, triethanolamine phosphate, $Na_6P_4O_{13}$, and combinations thereof.

42. (previously presented) The working liquid of claim 41 wherein the complexing agent comprises a material selected from the group consisting of carboxylic acid, ammonia, amines, halides, pseudohalides, carboxylates, thiolates, multidentate complexing agents, and combinations thereof.

43. (previously presented) The working liquid of claim 42, wherein the multidentate complexing agent comprises a material selected from the group consisting of polyphosphates, 1,3-diketones, aminoalcohols, aromatic heterocyclic bases, phenols, aminophenols, oximes,

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Schiff bases, sulfur compounds, multidentate amines, ethylenediamine, diethylene-triamine, triethylenetetramine, multidentate carboxylic acid, citric acid, tartaric acid, oxalic acid, gluconic acid, nitriloacetic acid, amino acids, glycine, common analytical chelating agents, ethylenediaminetetraacetic acid, and combinations thereof.

44. (canceled)